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**Jasun Gong\*** ([jasun@pitt.edu](mailto:jasun@pitt.edu)), Department of Mathematics, University of Pittsburgh, 301 Thackeray Hall, Pittsburgh, PA 15260. *Regularity of Quasi-minimizers for Non-homogeneous Energy Functionals on Metric Spaces*. Preliminary report.

It is well-known that on domains  $\Omega$  on Euclidean spaces, minimizers of the  $p$ -Dirichlet energy integral

$$u \mapsto \int_{\Omega} |\nabla u|^p dx$$

enjoy a rich regularity theory. For instance, they are Hölder continuous and satisfy the Harnack inequality. Though such functions are solutions to an associated Euler-Lagrange equation (of elliptic type), there are techniques of proof that rely solely on their energy-minimizing property. In fact, quasi-minimizers — roughly speaking, functions which almost minimize energy — also have similar regularity properties, as shown by Giaquinta and Giusti in the 1980s.

Many notions of analysis, such as Sobolev spaces, extend to the setting of metric measure spaces (that is, metric spaces equipped with Borel measures). In this setting, we will show that quasiminimizers of energy integrals — both homogeneous and non-homogeneous — have similar regularity properties as their Euclidean counterparts. These results extend the work of J. Kinnunen and N. Shanmugalingam, as well as of J. Björn and N. Marola.

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